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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/585,055	10/14/2008	Vesa Myllymaki	BGG0002US	6188

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EXAMINER	
QIAN, YUN	
ART UNIT	**PAPER NUMBER**
1793	

NOTIFICATION DATE	DELIVERY MODE
06/24/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/585,055	MYLLYMAKI ET AL.	
	Examiner	Art Unit	
	YUN QIAN	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 May 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/25/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-3, 8-10, 12-15 and 17 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-6, 12,14 and 19 of copending Application No.10/568,458. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1-6, 12, 14 and 19 of the copending Application No. 10/568,458 teaches a method for delignocelluosic of the lignocellulosic materials with an ionic liquid assisted in microwave irradiation and/or pressure.

Lignocellulosic material is a combination of lignin, hemicellulose, and cellulose. It would have been obvious to one of ordinary skill in the art at the time the invention was

made to apply the method for treatment of lignocellulosic material of copending Application 10/568,458 to treat a simpler molecular of polysaccharide (starch).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-2, 9-14 and 17 are rejected under 35 U.S.C.103 (a) as being unpatentable over Swatloski et al. (WO 03/029329).

Regarding claim 1, Swatloski et al. teaches a method for dissolving cellulose in an ionic liquid with agitation and heating under microwave irradiation at <150 ^{0}C (abstract, page 4, paragraph 4).

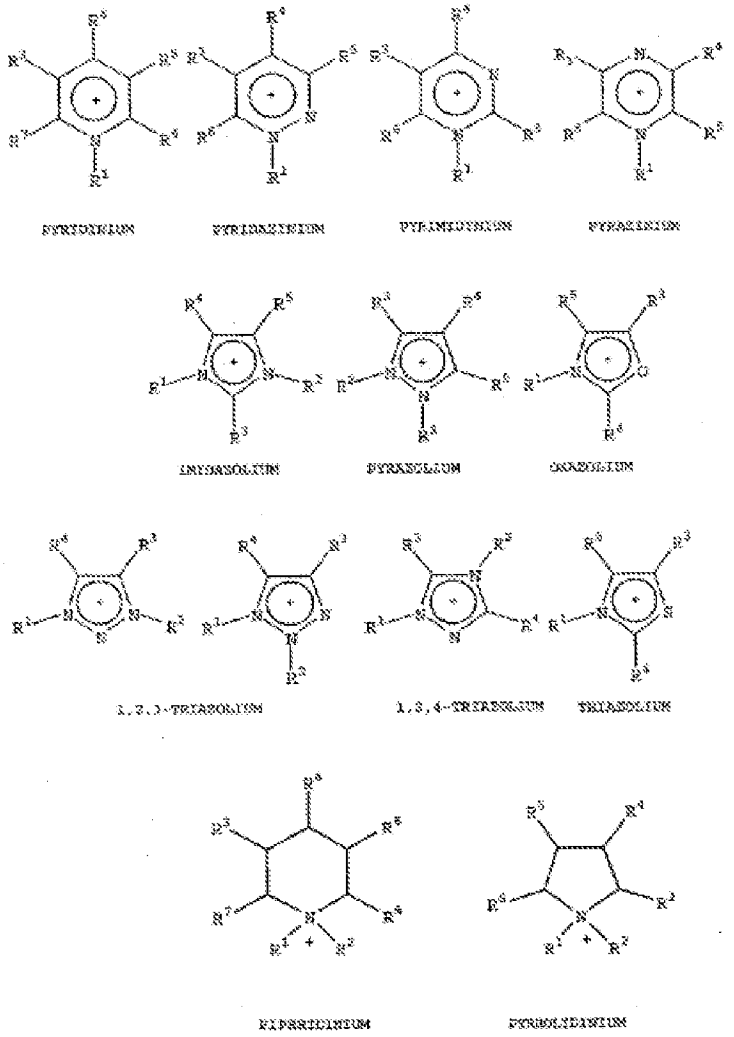
However, Swatloski et al. does not specifically disclose a method for dissolving starch as per applicant claim 1.

Although cellulose (β-D-glucose) and starch (α-D-glucose) have similar structures (polymer of glucose monomer), cellulose poses more challenges to hydrolyze due to its higher crystalline and lower solubility in solution.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the teachings of Swatloski et al. into the treatment for starch to obtain the invention as specified in the claim 1, motivated by the fact that the cellulose and its derivatives can be used as a substituted source of polymers for applications in paints, plastics and other formulation materials (page 1, paragraph 2). Since the process of Swatloski et al. dissolve a cellulose material, one would have a reasonable expectation of success for dissolving a less crystalline starch material.

Regarding claim 2 as discussed above, the process taught by Swatloski et al. includes microwave irradiation.

Regarding claims 9-11 and 17, the cation of the ionic liquid solvent taught by Swatloski et al. is selected from group consisting of:



The cation comprises imidazolium and the anion is halogen. It meets the claimed limitations (page 5, and claim 55).

Regarding claims 12-14, the process taught by Swatloski et al. comprising separating the product by adding a non-solvent (water, alcohol, or ketone) to precipitate the product (claims 44-51 and 60).

Claims 3-8 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swatloski et al. (WO 03/029329) in view of Bergstrom et al. (US 4,000,032).

Regarding claims 3 and 15, although Swatloski et al. teaches a method for dissolving cellulose in an ionic liquid with agitation and heating under microwave irradiation at <150 ^{0}C, he does not specifically teach applying pressure to assist in dissolution as per applicant claims 3 and 15.

Bergstrom et al., also drawn to processes for the disruption or destruction (depolymerization) of the natural structure of the long chain polymeric polysaccharides (lignocellulose), via microwave irradiation, teaches that, if desired, superatomspheric and subatomspheric pressures can be used. (Abstract, col. 4, lines 43-49. col.5, Example, claims 9-10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Bergstrom et al. and Swatloski et al. to obtain the invention as specified in the claims 3 and 15, motivated by the fact that the process with subatomspheric pressure increases the disruptive or disintegrating effect on structure of the lignocellulosic material (Bergstrom et al. at col. 4, lines 50-54).

Regarding claim 4, the temperature taught by Bergstrom et al. is at least 70 ^{0}C as per applicant claim 4 (claim 2).

Regarding claims 5, the process time taught by Bergstrom et al. is determined based on the nature of material itself and weight of material. For example, a 10-Kg pine chips per minute is treated with steam for four minutes at a temperature of 100 ^{0}C and

ground at a pressure of 0.32 MPa in a disc mill, to which 475 kilowatts of power is supplied (Col.5, Example).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the process conditions, i. e., the temperature, reaction time, stoichiometric, etc. to achieve an acceptable yield and purity of product, particularly in view of the fact that;

> "The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages", In re Peterson 65 USPQ2d 1379 (CAFC 2003).

Also, In re Geisler 43 USPQ2d 1365 (Fed. Cir. 1997); In re Woodruff, 16 USPQ2d 1934 (CCPA 1976); In re Malagari, 182 USPQ 549, 553 (CCPA 1974) and MPEP 2144.05.

Regarding claims 6-7, the examiner realizes that not all properties of products are stated in the references. Since the references teach all of the claimed reagents and conditions, therefore, the same starting starches would expect to be depolymerized into the same products as instantly claimed.

Regarding claim 8, the ionic liquid solvent taught by Swatloski et al. is molten at a temperature <150 ^{0}C (claim 6). It is encompassed by the recited claim.

Regarding claim 16, the temperature taught by Bergstrom et al. is at least 70 ^{0}C. It overlaps the claimed ranges. The references differ from Applicant's recitations of claims by not disclosing identical ranges. However, the reference discloses

"overlapping" ranges, and overlapping ranges have been held to establish prima facie obviousness (MPEP 2144.05).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YUN QIAN whose telephone number is (571)270-5834. The examiner can normally be reached on Monday-Thursday, 10:00am -4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J.A. LORENGO/
Supervisory Patent Examiner, Art Unit 1793

/YUN QIAN/
Examiner, Art Unit 1793